Before The
Federal Communications Division
Washington, D.C. 20554

In the Matter of:		
Digital Audio Broadcasting Systems		
And Their Impact on Existing Analog		MM Docket No. 99-325
Radio Broadcast Services		

To The Commission:

REPLY COMMENTS ON
National Radio Systems Committee's
'IBOC Digital Radio Broadcasting Standard NRSC-5'

The following reply comments are submitted in response to points made by various entities throughout the proceeding referenced in the caption above. Each point is roughly paraphrased in order to bring context to the comments thus presented below.

******This document replaces my earlier reply comment filing, dated Aug 8, 2005. That filing contains a prior version of the intended comment document. ******

1. In order for terrestrial radio to remain competitive, it must bring FM and AM media that are different and better than analog means and methods currently deliver.

The very real decline in overall radio listening is not subject to debate. However the reasons for this decline are both relevant to the topic at hand; namely, digital radio broadcast, and clearly are subject to debate.

A significant percentage of the Industry comments presented in this proceeding, to date, all cite quality as the reason for radio being increasingly unable to compete in the media marketplace. However the reality is far different. Content is the most often cited public reason for failure to listen to the radio. Industry consolidation has brought with it a tight focus on specific demographics along with a more standardized programming model. Both of these things ignore vast numbers of potential listeners, formally better served in the more diverse radio environment of the past. The loss of these potential listeners cannot be ignored and cannot be explained by quality reasons alone, when the overall diversity of radio programming remains sharply reduced in recent times. The reality is quality has nothing to do with the issue, content and presentation do.[1-5]

The quality improvements IBOC digital radio broadcast bring to the table are fair for FM radio, but do not cause significant level of service changes to existing radio gear. This technology, when used on the AM broadcast band, delivers marginal quality improvements while at the same time also causing significant level of service degradation to existing radios in service today; thus, giving existing listeners another reason to tune out while at the same time asking them to purchase new radios that are increasingly likely to fail to deliver the content they are looking for in the first place.

Early Ibiquity Corporation press releases detailed the FM quality to be on par with Compact Disc and the AM quality to be on par with FM analog radio. Subsequent statements redefined these to be "Compact Disc like" and "FM radio like". The physical limitations of the RF spectrum and it's information carrying capability limit the overall digital radio broadcast bit rates to those well below the industry accepted norms for CD quality audio delivery. Digital audio compression technology is improving however. We may see a time in the future where these low bit rates do actually deliver audio quality equal to the Compact Disc. The reality today is an audio stream, impressive given the limitations, that makes as many trade offs as existing analog technologies currently do.[6]

On the matter of radio quality in general, it is difficult, if not impossible to, out compete good enough in a cost practical way. Quality analog reproduction has been available to consumers, on both AM and FM, for many years. Advancements in technology combined with economies of scale have brought the cost of quality radios well within the reach of the average media consumer. For the last 10 years, the focus of radio receiver manufacturers has been on features, not overall sonic quality. The popularity of integrated radio units that combine radio with other media delivery technologies clearly supports the idea that content rules over quality where the average media consumer is concerned.

In summary, what people hear on their radios is more important than the sonic quality is. Why then are we asking people to buy new high-quality radios when quality is not the primary issue?

These things combined do not support the quality justification given for IBOC digital radio broadcast. One has to wonder if all the expensive IBOC digital radio broadcast implementation is worth the trouble given it does not properly address the core problem of declining radio listeners.

2. 'The window for change is narrow'

The sheer amount of ongoing research and development happening as you read this clearly shows a technology not yet cooked. FM IBOC transmissions remain in a state of flux as 'multi-cast' broadcasts are being developed and refined, AM IBOC transmissions introduce significant noise and quality trade offs, and audio codec technology developments are incomplete as well.

Given the lack of demonstrable public demand for digital radio and the number of outstanding issues, I find it hard to justify a narrow window for technology change, particularly when the quality and cost expectations are being changed as well. If the radio industry is truly seeing a listener crisis, while failing to properly address content issues, said decline cannot be used as a solid justification for a rapid implementation of digital radio, simply because the two problems are not related.

There is a lot of potential revenue in new radio receiver sales and HD radio codec licensing. However these two things have little to do with the overall health of the radio industry as a whole when listeners are not receiving the content they are looking for. Consider this:

If you had the choice of two radio stations, one that had the best possible quality, but poor programming and the other having marginal quality with outstanding programming, which station would you prefer to listen to?

Most ordinary people would seek programming they can relate to, not the programming that sounds the best. Despite this rather obvious point, the radio industry is telling the commission better sound is the right solution. This makes no sense at all and does not justify the idea that we need to adopt digital radio now before it is too late. However, it does clearly suggest some focused effort on better addressing

the content needs of the listening radio public.

3. Learning from the mistake of AM Stereo

Failure to properly choose and ratify a unified AM Stereo broadcast standard harmed the industry through general confusion. Broadcasters were not sure which system to use, receiver manufacturers were reluctant to support all systems, for cost and other reasons, all leaving the public largely unaware of the technology and it's obvious benefits over traditional AM broadcasts.

Significantly, the various AM Stereo modulation methods all had various strengths and weaknesses. Rather than create a panel to objectively evaluate the various systems, the "free market" approach was used. NRSC-5, as proposed does not specify the audio codec to be used. In this way, IBOC is flawed in the same way that AM Stereo was. Future codec developments, alternative uses of the broadcast bit stream, and other variable elements are likely to fragment the digital radio landscape in the same way the various AM Stereo modulation techniques did. Software radios can help to mitigate this, but are we really going to ask radio consumers to treat their radios like they do their computers? Will digital radios meet the long service life expectations existing analog radios currently set? Does the listening public want to upgrade their radios, only to receive minor quality improvements? Do they need to? Will they be able to do these things, or will they experience frustration only to return to easy to use analog radio receivers?

These and other questions do not paint the picture necessary for the average consumer to believe HD radio will be any different than AM Stereo was.

Should the commission go forward with digital radio, despite the many valid questions and concerns surrounding the technology, mandated support for existing AM Stereo broadcasts in HD radio receivers would allow broadcasters currently using the technology to better leverage it while the AM IBOC issues continue to be worked out through ongoing research and development. Both FM analog mono and stereo broadcasts are supported, why not require the same for AM?

AM broadcasters, who either are unable to implement IBOC for technical or cost reasons can choose to broadcast AM Stereo broadcasts and still benefit from the new digital radio receivers. This benefit also would be felt by owners of existing quality AM Stereo radios and those for sale today.

AM IBOC broadcasts still have many technical issues that many comments here argue delay the implementation of digital radio as a whole. Support for improved AM broadcasts can be bolstered with AM Stereo, particularly during night time operations, with little to no significant impact on the overall digital radio system implementation as a whole.

4. Quickly approve AM IBOC for night time operation

Essentially those entities making this plea are saying; "we know it isn't perfect, but we want it anyway." Some AM stations have recently discontinued AM IBOC operation because of listener complaints.[7]

> *"BCA writes: "The implications for AM service [when more stations switch to IBOC] are staggering. If the IBOC standard is not modified to eliminate the interference that it currently causes, the millions of listeners who depend upon AM..... will be*

deprived of service."

One of these stations reverted back to C-Quam AM Stereo rather than continue noisy and destructive IBOC broadcasts. If new HD radio receivers were able to also properly receive AM Stereo broadcasts, the industry would have solid solutions to problems like this one. Given the early state of digital radio and the small number of receivers sold to date, this change is easily incorporated into the digital radio rule making.

Why go forward with a system that we know will cause a lot of problems when solid alternatives are proven and in use today? (AM Stereo) It is my opinion, we should make the best use of the AM band and our existing radios while digital AM sees further study before implementation. The software nature of digital radios clearly allows for a more successful digital AM system to be deployed at such time as it is available for use.

Respectfully Submitted,

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